(i) Critical weight;
(ii) Critical center of gravity;
(iii) The landing gear extended; and
(iv) The rotorcraft trimmed at the minimum rate of descent airspeed.
(2) Airspeeds from best angle-of-glide airspeed − 10 kt to the best angle-of-glide airspeed + 10 kt, with—
(i) Critical weight;
(ii) Critical center of gravity;
(iii) The landing gear retracted; and
(iv) The rotorcraft trimmed at the best angle-of-glide airspeed.

(Secs. 313(a), 601, 603, 604, and 605 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425); and sec. 6(c) of the Dept. of Transportation Act (49 U.S.C. 1655(c)))

[Doc. No. 5074, 29 FR 15695, Nov. 24, 1964, as amended by Amdt. 27–2, 33 FR 963, Jan. 26, 1968; Amdt. 27–11, 41 FR 55468, Dec. 20, 1976; Amdt. 27–14, 43 FR 2325, Jan. 16, 1978; Amdt. 27–21, 49 FR 44433, Nov. 6, 1984; Amdt. 27–34, 62 FR 46173, Aug. 29, 1997; Amdt. No. 27–44, 73 FR 10999, Feb. 29, 2008]

§ 27.177 Static directional stability.

(a) The directional controls must operate in such a manner that the sense and direction of motion of the rotorcraft following control displacement are in the direction of the pedal motion with the throttle and collective controls held constant at the trim conditions specified in § 27.175(a), (b), and (c). Sideslip angles must increase with steadily increasing directional control deflection for sideslip angles up to the lesser of—
(1) ±25 degrees from trim at a speed of 15 knots less than the speed for minimum rate of descent varying linearly to ±10 degrees from trim at V_{NE};
(2) The steady state sideslip angles established by § 27.351;
(3) A sideslip angle selected by the applicant, which corresponds to a sideforce of at least 0.1g; or
(4) The sideslip angle attained by maximum directional control input.
(b) Sufficient cues must accompany the sideslip to alert the pilot when the aircraft is approaching the sideslip limits.
(c) During the maneuver specified in paragraph (a) of this section, the sideslip angle versus directional control position curve may have a negative slope within a small range of angles around trim, provided the desired heading can be maintained without exceptional piloting skill or alertness.

[Amdt. No. 27–44, 73 FR 11000, Feb. 29, 2008]

GROUND AND WATER HANDLING CHARACTERISTICS

§ 27.231 General.

The rotorcraft must have satisfactory ground and water handling characteristics, including freedom from uncontrollable tendencies in any condition expected in operation.

§ 27.235 Taxiing condition.

The rotorcraft must be designed to withstand the loads that would occur when the rotorcraft is taxied over the roughest ground that may reasonably be expected in normal operation.

§ 27.239 Spray characteristics.

If certification for water operation is requested, no spray characteristics during taxiing, takeoff, or landing may obscure the vision of the pilot or damage the rotors, propellers, or other parts of the rotorcraft.

§ 27.241 Ground resonance.

The rotorcraft may have no dangerous tendency to oscillate on the ground with the rotor turning.

MISCELLANEOUS FLIGHT REQUIREMENTS

§ 27.251 Vibration.

Each part of the rotorcraft must be free from excessive vibration under each appropriate speed and power condition.

Subpart C—Strength Requirements

GENERAL

§ 27.301 Loads.

(a) Strength requirements are specified in terms of limit loads (the maximum loads to be expected in service) and ultimate loads (limit loads multiplied by prescribed factors of safety). Unless otherwise provided, prescribed loads are limit loads.
(b) Unless otherwise provided, the specified air, ground, and water loads must be placed in equilibrium with inertia forces, considering each item of mass in the rotorcraft. These loads